

Future



The future is already here – it's just not evenly distributed.
—William Gibson

Augmented Reality

- Overlaying of digital data in the real world
- Image recognition



AR Coming

Window to the World

Bring Your Own Device (BYOD)

- Students bring their own Wi-Fi enabled devices
- Benefits
 - Access
 - Enhance learning experience
 - Learners familiar
 - Engagement
 - Low cost
- Issues
 - Bandwidth (Wi-Fi access)
 - Cross platform issues
 - Equity



Cloud Computing

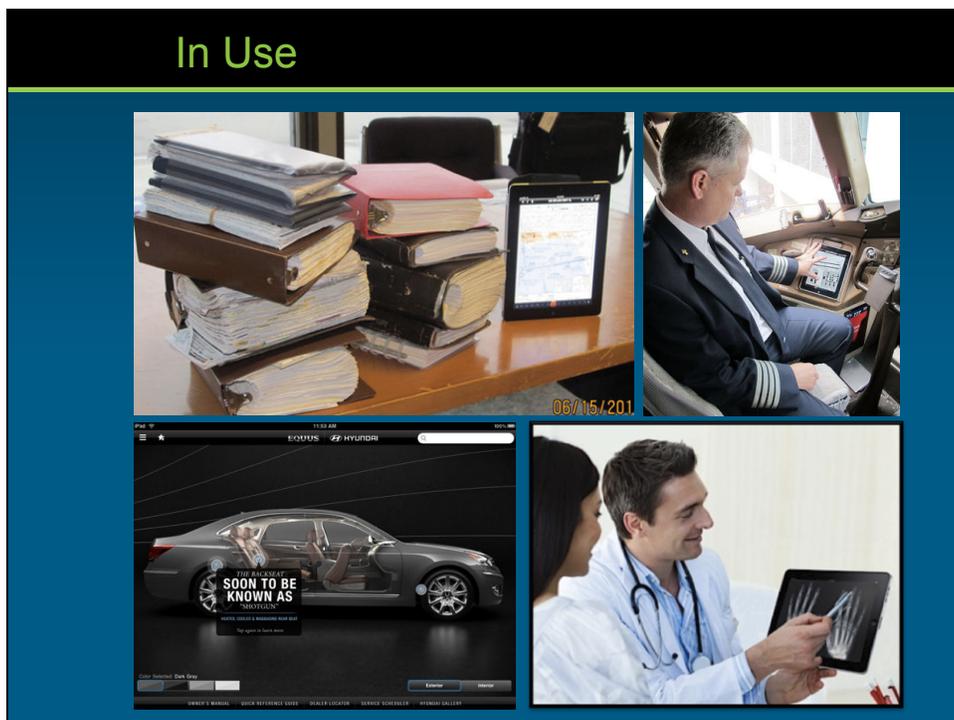
- Ubiquitous, convenient, on-demand network access
 - Processing
 - Search
 - Storage and retrieval
 - Sharing
- Benefits
 - Accessed from anywhere, anytime and on any device
- Issues
 - Security
 - Connectivity



eBooks

- Stats
 - Amazon selling 105 ebooks to 100 print books
 - Textbook rentals
 - Library checkouts
 - South Korea replacing all paper by 2015 (tablets)
- Benefits
 - Interactivity
 - Weight
 - Access
 - Cost
 - Long tail
- Issues
 - Availability
 - Formats



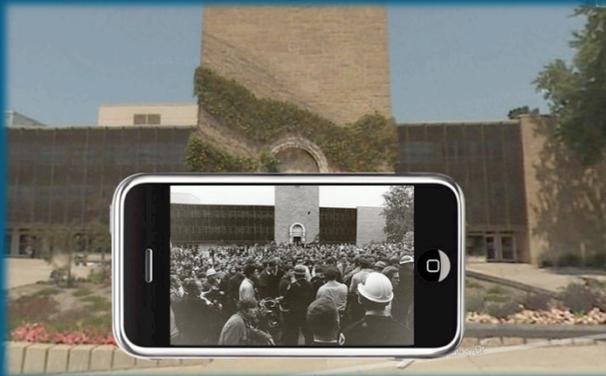


Location

- GPS
- LocataLites



Precise positioning: A network of these transmitters, each the size of a hardback book, can enable nearby devices to locate themselves to within a few centimeters.
Credit: Locata



Atlantis STS-135

- SpaceLab for iOS app by Odyssey Space Research
- NASA Astronauts use:
 - Accelerometer
 - Three-axis gyroscopes
 - Cameras
- For:
 - Photos of the earth
 - Calibrating measurements
 - Estimating latitude and longitude
 - Monitoring the effects of radiation on the device



Future for Learning



Ubiquitous

- Always connected
- Cloud-based
- Device-independent



Content

- Microlearning
- Spaced
- Peer-generated
- Live conferencing



Personal

- Individualized
- “Understands” needs and existing knowledge

Microlearning

- Bitesize
- Ubiquitous
- Portable
- Informal
- Situational
- Personalized
- Courselets
- Reference materials
- Reinforcement
- Performance support



Tomi Ahonen on the Future

Mobile is the 7th Mass Media

A discussion with Tomi Ahonen,
Author, Educator and Evangelist for New Technologies

What is the future of mobile?



Consumer Predictions





Thin as a credit card



Transparent tools



Eco-friendly



Fully customizable

Mobile Phones Today



acer	ALCATEL	i-mate	i-mobyle	Qtek	SAGEM
AMOI	Apple	ICE MOBILE	innostream	SAMSUNG	sendō
ASUS	at&t	INQ	KYOCERA	SEWON	SHARP
BENEFON	BenQ	LG	maxon	SIEMENS	sonim
BENQ-SIEMENS	bird	micromax	Microsoft	SONY	Sony Ericsson
BlackBerry	BLU	MITAC	MITSUBISHI ELECTRIC	spice	•••••Mobile•••••
BOSCH	CHEACOMM	modu	MOTOROLA	me.me	Telit
DELL	ERICSSON	mwg	NEC	البريد الإلكتروني THURAYA	TOSHIBA
STEN	FUJITSU SIEMENS	neonode	NOKIA	orange	verykool
garmin asus	GIGABYTE COMMUNICATIONS	O2	orange	Panasonic	vodafone
Haier	hp	o2	Philips	VK Mobile	xcute
htc	HUAWEI	PANTECH		WND	
				ZTE	





Devices



Future Devices?

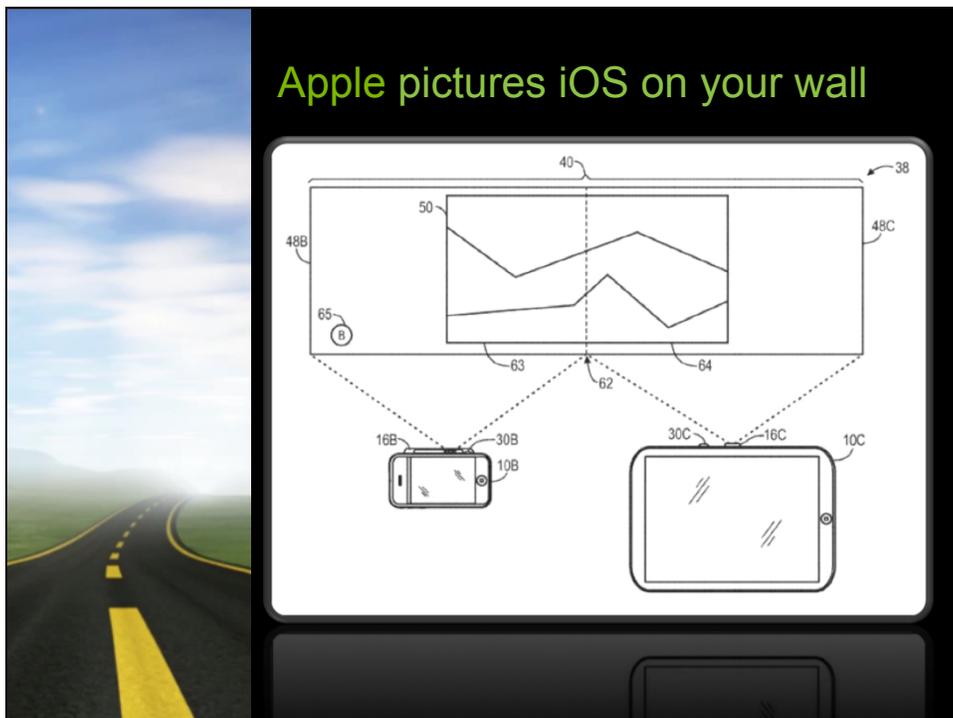
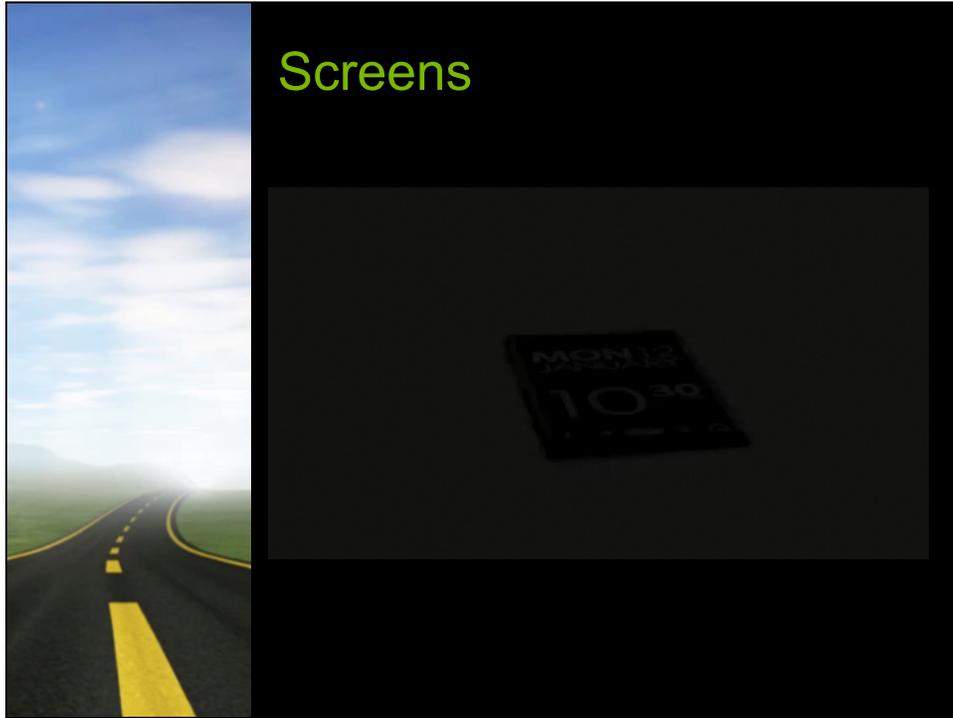
Multi-sensory

- Smell
- Sight
- Hearing
- Touch

It can

- Detect
- Transmit
- Emit smell
- Radiate colours
- Light
- Temperature



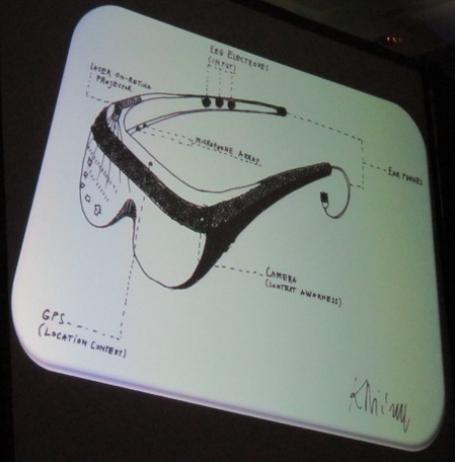




Internet Eyeglasses

Szymon Slupik at eComm 2011

- Laser based displays – MEMS
- Brain waves sensing




Paper Replacement

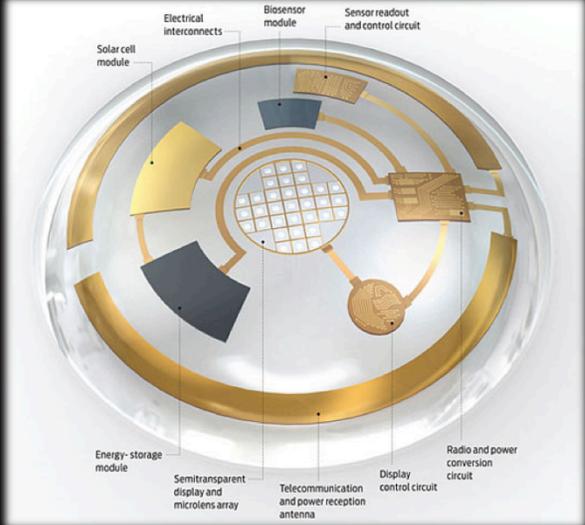
- NoteSlate
- High enough refresh rate for note taking and sketching
- Could fully replace paper





Smart Contact Lenses

- From health monitoring to text translation




Contact Lenses AR

- University of Washington
- Solar powered
- Transparent LEDs





Near Field Communications (NFC)

3 modes

- Reader/writer
- Peer-to-peer
- Card emulation




John Doe
1910 - 1950
In Loving Memory

Touch NFC phone against stone. See life story.

NFC-RFID Wireless Microchip Inside

RosettaStone Disk Pre-installed at Factory



Sensors

- Altimeter
- Heart monitor
- Perspiration
- Temperature
- Humidity
- Mood




Imager

Microphone

Light

GPS

Touch

Altimeter

Temperature

Bio Sensors

Heart Rate

Pressure

Toxin Sensors

Magnetometer

Motion

Capabilities

On-body and wearable computing

Battery Life

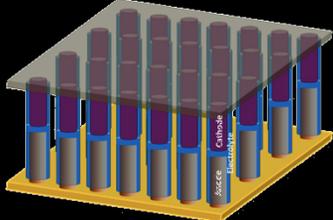
Year	Disk capacity	CPU speed	Available RAM	Wireless transfer speed	Battery energy density
1990	1	1	1	1	1
1994	~5	~5	~5	~5	~5
1996	~20	~20	~20	~20	~20
1998	~50	~50	~50	~50	~50
2000	~100	~100	~100	~100	~50
2002	~200	~200	~200	~200	~50

Mobile Computing Improvement – Paradiso, *et al.* Pervasive Computing, IEEE, 2005.



Power

- Low cost flexible solar cells
- Microscopic battery (Rice University)





Enhanced energy & power capacity

- Army Soldier Research, Development and Engineering Center (Natick, Mass.)
 - "Personal energy harvesters"
 - Kinetics-based solar
 - Wind power
- Apple and Samsung
 - Organic photovoltaic cells
- Working prototype of human heartbeat powering iPod





Gestures

A person (top) draws a curved line with his finger, and the gesture is captured by a wearable camera (bottom). The line is transferred to a mobile device, which sends it to a recipient's screen for display.

Credit: Hasso Plattner Institute



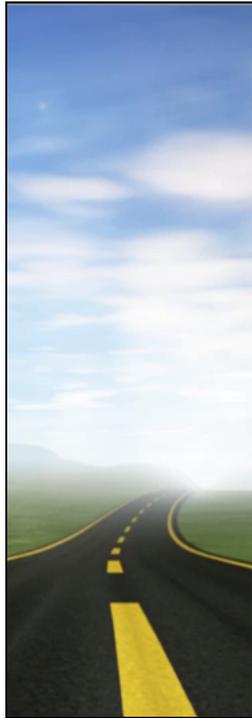


Other Changes





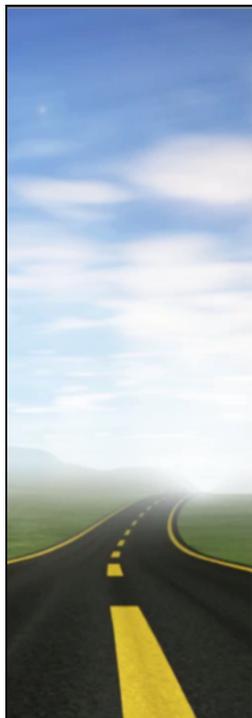

OHIO STATE UNIVER



What will smartphones do for us in 2020?

“Coupled with the almost **unlimited computing power** from the **cloud** (e.g. data centers and server farms), available to smartphones through wireless connectivity, the capability to **see, hear, feel**, and even **smell** continuously will make our smartphones truly like a **human companion**.”

Lin Zhong, Rice University



In Labs Today

- Cars of the future will **talk** to each other by 2014 (5/2011)
- Queen’s University Human Media Lab, the **PaperPhone** (5/2011)
- University of Illinois at Urbana-Champaign working on a lithium-ion **battery** that can be 90 percent **charged** in two minutes (4/2011)
- EyePhone, developed at Dartmouth College, tracks a person’s eye relative to a phone’s screen, letting users activate applications by **blinking**. (5/2010)
- A new device from Dartmouth College lets users select and dial a contact's phone number just by **thinking about it**. (3/2010)





- Augmented Reality - <http://www.tripwiremagazine.com/2011/07/45-brilliant-augmented-reality-iphone-apps.html> and <http://www.businessinsider.com/best-augmented-reality-apps-for-iphone-and-ios-2011-3?op=1>
- Tablets - <http://skattertech.com/2011/02/infographic-blackberry-playbook-vs-dell-streak-7-vs-apple-ipad-vs-motorola-xoom/>
- Aviation stats - <http://www.nytimes.com/2011/06/21/business/global/21iht-RAV-INFLIGHT21.html>
- Consumers - <http://en.eyeka.net/2011/04/smartphone/>
- 3D - <http://www.networkworld.com/news/2010/040210-sharp-develops-a-3d-screen.html>
- Internet glasses - <http://www.zdnet.com/blog/emergingtech/why-the-future-of-mobile-is-screenless-touchless/2608>
- Paper - <http://www.technologyreview.com/blog/mimssbits/27018/>
- Contacts - <http://spectrum.ieee.org/biomedical/bionics/augmented-reality-in-a-contact-lens/>
- Smart contacts - <http://www.fastcompany.com/1623012/smart-contact-lens-bluetooth-future>
- Wristbands - <http://www.technologyreview.com/computing/26537/page1/>
- Jawbone - <http://mobihealthnews.com/11870/jawbone-to-challenge-fitbit-with-up-device/>
- Smartphone future - <http://en.eyeka.net/2011/04/smartphone/>
- On body computing - <http://www.ottawacitizen.com/technology/body%2Bcomputing%2Bcoming%2Bsoon/4039395/story.html>
- Glasses - <http://www.popsci.com/science/article/2011-07/glasses-packed-smarphone-tech-could-help-visually-impaired-people-see-again>
- Rollphone - <http://www.walyou.com/blog/2010/08/12/rollphone-cell-phone-concept/>
- Gestures - <http://www.technologyreview.com/communications/25380/>
- Cars of future - <http://www.pocket-lint.com/news/40083/pxp-car-2-car-wireless-technology-demo>
- EyePhone - <http://www.technologyreview.com/computing/25369/>
- Mind control - <http://www.technologyreview.com/blog/editors/24993/>
- Stick-On Tattoo - <http://www.technologyreview.com/computing/38296/>
- NFC - <http://mashable.com/2011/08/11/near-field-communication-guide/>
- 2020 - <http://cblog.chron.com/computingatrice/2010/05/what-will-smartphones-do-for-us-in-2020/>
- Shoe power - <http://www.cnn.com/2011/TECH/innovation/08/24/cellphone.walking.power/>

Questions? Discussion



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